

The Relationship Between Work-life Balance, Stress, and Injury in Construction
Trade Workers

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A thesis

submitted in partial fulfillment of the
requirements for the degree of

Master of Public Health

University of Washington

2019

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Program Authorized to Offer Degree:

Occupational and Environmental Health Services

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Abstract

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Objectives: The construction industry is characterized by a high burden of occupational injuries. In addition to physical risk factors, psychosocial risk factors such as work-life balance can increase the risk for injury. Women, who are underrepresented in the construction trades, are disproportionately affected by these factors, which may increase the risk for adverse health outcomes. Women within the trades have been shown to struggle with work-life balance due to a number of factors including long work hours, difficulty finding child care, and ongoing responsibility for unpaid labor in the home. The purpose of this study was to investigate the association between work-life balance, stress, and injury in construction trades workers in order to pave the way for changes in policy and practices within the trades that will allow for a safe working environment for all workers.

Methods: We performed a cross-sectional analysis of data from the Safety and Health Empowerment for Women in Trades (SHEWT) study. We studied data obtained from 291 construction workers in Washington State who participated in the SHEWT survey. We used logistic regression to assess the association between: 1) work-life balance and perceived stress; and 2) the association between perceived stress and injury, adjusted for relevant confounders. Perceived stress was measured using the validated Perceived Stress Scale, and work-life balance

was assessed using questions from the NIOSH Quality of Work Life Questionnaire. The presence or absence of injury was determined using questions which assessed whether or not trades workers had an injury in the last year which required medical attention, first aid, or time off work. In both analyses, we assessed for effect modification by gender.

Results: Reporting poor work-life balance was associated with 4.38 (95% CI 1.87, 10.61) times the odds of high perceived stress, after adjustment for trade, age, and gender. Additionally, being a woman was associated with 2.38 (95% CI 1.23, 4.76) times the odds of high perceived stress when compared to being a man, after adjustment for work-life balance, trade, and age. High perceived stress was associated with 1.96 (95% CI 1.08-3.54) times the odds of injury, after adjustment for trade and gender. Additionally, being a woman was associated with 2.94 (95% CI 1.49-6.25) times the odds of injury when compared to being a man, after adjustment for stress and trade. There was no evidence of effect modification by gender in either analysis.

Conclusions: This study demonstrated an association between poor work-life balance and perceived stress and between perceived stress and injury in construction trades workers. Women were at higher risk of high stress and injury compared to men, after adjustment for other factors. Future work should evaluate the effectiveness of efforts to address work-life balance and perceived stress in injury prevention efforts and to foster safe participation of women, in addition to men, in the construction trades.

INTRODUCTION:

A. Women as a minority in the construction trades

Women account for only 3.4% of construction workers in the United States, a percentage that has not changed over the last 40 years (United States Department of Labor, 2019) (Hegewisch & O'Farrell, 2015). Due to a growing shortage of skilled workers in the construction trades and a thriving economy, there has been a push to draw in new workers, including women (Institute for Women's Policy Research, 2014). While research has shown that women enjoy working within the construction trades (due to high pay, family benefits, ability to learn tangible skills, etc.) and are able to perform these skilled jobs, they continue to face a variety of barriers to entering and staying in the field which include isolation, intimidation, concern for slow career progression, difficulty achieving work-life balance, an unwelcoming, male-dominated culture, discrimination, and harassment (Hegewisch & O'Farrell, 2015) (Menches & Abraham, 2007) (Moir, Thomson, & Kelleher, 2001). Despite their working status, the social expectation that women will continue to perform the majority of unpaid labor at home (e.g. housework, child care, shopping) still exists (Walters & Whitehouse, 2012) (Hunt & Annandale, 1993). This places women in a difficult situation, as women who have to adjust their work schedules to complete their home responsibilities may be perceived as less committed to their jobs (Watts, 2009). The relationship between work-life balance and gender will be discussed further below in section E.

The way in which these factors contribute to health, particularly levels of perceived stress and injuries, is not yet well understood. While these are concerns for all working persons, tradeswomen are a unique population in that they work in a high demand, male-dominated industry that historically does not adequately support women (Hegewisch & O'Farrell, 2015).

B. Injury as a problem in the construction trades

The construction industry is characterized by a high burden of occupational injuries. In 2013, the construction trades were identified in a Washington State Department of Labor and Industries' report as one of the highest risk industries for workers' health and were prioritized for further research into prevention strategies (Anderson, Bonauto, & Adams, 2013). In this report, Anderson et al described the distribution of injuries, including by National Occupational Research Agenda (NORA) sectors, which classify industries into 10 different sectors. Using Washington State Fund (SF) workers' compensation compensable injury claims data from 2002-2010, workers in the NORA sector "construction" had 477.5 injury claims per 10,000 full-time equivalents (compared to 19.1/10,000 FTE in all sectors combined) with a median cost per claim of \$14,828, the highest of any sector. Additionally, the construction sector had a median of 69 days of work time lost per claim, compared to an average of 43 days of time lost in all sectors combined. Nationally, in 2017, the most common causes of death in the construction industry were falls, being struck by an object, electrocution, and being caught in or between an object or equipment (Occupational Health and Safety Administration., 2018). This information suggests a need for ongoing research into the reason for the high prevalence of injury within the construction trades and ways that injuries can be prevented. While there are no data available that describe the injury rates for women in the trades, as they are so under-represented, studies do suggest that they may be more at risk of injury due to the numerous stressors they experience (Curtis, Meischke, Stover, Simcox, & Seixas, 2018).

C. Risk factors for poor health outcomes in the construction trades

Workers in the construction trades are at risk for poor health outcomes due to a variety of different factors. These factors include working at high heights, improper fall protection measures, use of heavy machinery (Occupational Health and Safety Administration., 2018), lifting requirements, awkward postures, and vibration exposures (Schneider, 2001).

In addition to physical factors, there are a variety of psychosocial factors these workers face. These include job strain, gender discrimination, racial discrimination, age discrimination, bullying, sexual harassment, overcompensation (pushing ones' body past its physical comfort to get the job done), suboptimal work-life balance, isolation, tokenism, negative safety climate, and lack of social support (Curtis, Meischke, Stover, Simcox, & Seixas, 2018). These psychosocial factors have been shown to adversely affect workers' health and safety as they have been shown to be associated with stress and both psychological and physical strain. For example, work by Goldenhar et al in 2003 described how some of these factors (overcompensation, safety climate, social support, harassment, discrimination) can lead to an increase in psychological symptoms, which have been associated with near miss incidents at work. Their work showed how both harassment and discrimination were associated with both physical and psychological symptoms in both men and women (Goldenhar, Williams, & Swanson, 2003). Researchers have also found that higher level of social support from supervisors and peers was associated with improved job satisfaction (Goldenhar, Williams, & Swanson, 2003) (Boschman, van der Molen, Sluiter, & Frings-Dresen, 2013). Multiple studies have shown a relationship between job satisfaction with both mental and physical health, and an especially strong association has been seen between decreased job satisfaction and depression, anxiety, and burnout (Faragher, Cass, & Cooper, 2005).

A number of these psychosocial factors, such as gender discrimination, sexual harassment, tokenism, and isolation, disproportionately affect women. Previous work has shown that sexual harassment, which disproportionately affects women, in the workplace affects job satisfaction and is associated with depression and threatened physical health (Fitzgerald, Drasgow, Hulin, Gelfand, & Magley, 1997). Studies have also shown that sexism and discrimination within the workplace affect one's job satisfaction and psychological well-being (Bond, Punnett, Pyle, Cazeca, & Cooperman, 2004). In addition to being a minority within the construction trades, women also disproportionately face these risk factors, which threaten their health.

D. Perceived stress in the construction trades

As discussed above, many of the psychosocial exposures discussed above have been associated with an increase in psychological symptoms, including stress. Elevated stress has been shown to play a role in diseases, including depression, cardiovascular disease (CVD), human immunodeficiency virus (HIV), and cancer (Cohen, Janicki-Deverts, & Miller, 2007). Work by Burns et al. in 2019 showed a relationship between increased levels of perceived stress and injury in recycling workers in Ghana (Burns, Sayler, & Neitzel, 2019). A study by Wilkins et al. showed a significantly increased odds of injury in working women who reported stress compared to those who did not (Wilkins & Mackenzie, 2007). A large prospective study in Denmark showed that higher perceived stress was associated with a higher incidence of sickness absence, a relationship that was much stronger for women than for men (Vester Thorsen, et al., 2019).

Factors such as job strain, gender discrimination, age discrimination, bullying, poor work-life balance, isolation, sexual harassment, poor safety climate, and inadequate social support have been reported by Curtis et al. to be associated with higher levels of perceived stress in women

construction trades workers (Curtis, Meischke, Stover, Simcox, & Seixas, 2018). In the same study, the only exposure significantly associated with elevated perceived stress in men was poor work-life balance. Given the various negative health outcomes associated with stress, it is important to continue to research the potential causes for, and outcomes of, increased perceived stress in construction trades workers.

E. Work-life balance in the construction trades

With the high demands of their careers, construction trades workers may find it difficult to find adequate work-life balance. Identified stressors for construction workers include long work hours, extensive commuting to jobs, a “hire and fire culture”, and tight deadlines (Beswick, Rogers, Corbett, Binch, & Jackson, 2007). Women often bear the burden of unpaid labor at home (household chores, childcare, etc.), which may lead to even more difficulty for women to achieve adequate work-life balance (Walters & Whitehouse, 2012). A study specifically looking at construction workers found that work-to-family conflict and family-to-work conflict were associated with elevated blood pressure, missing work for injury, and reports of pain (Bodner, Kraner, Bradford, Hammer, & Truxillo, 2014). One study of workers in various industries showed that the presence of work-family conflict, when work demands interfere with one’s abilities to address family demands and vice-versa, is associated with depression, poor physical health, and heavy alcohol use (Frone, Russell, & Barnes, 1996). Work-family conflict has also been associated with a variety of psychosocial outcomes, including job dissatisfaction, burnout, life dissatisfaction, and marital dissatisfaction (Allen, Herst, Bruck, & Sutton, 2000). While these factors indicate there is a relationship between work-life balance and psychosocial stress and health, the relationship of work-life balance with stress and occupational injury has not been fully explored.

G. Specific Aims

The specific aims of this study are:

Aim 1: To determine the association between work-life balance and perceived stress in construction trades workers. The working hypothesis is that poor work-life balance is associated with higher levels of perceived stress.

Sub-aim 1: To determine how this association differs between men and women. The working hypothesis is that poor work-life balance is associated with higher levels of perceived stress in both men and women, but that the magnitude of this relationship is higher in women than in men.

Aim 2: To determine the association between perceived stress and injury in construction trades workers. The working hypothesis is that higher levels of perceived stress are associated with higher risk of injury.

Sub-aim 2: To determine how this association differs between men and women. The working hypothesis is that higher levels of perceived stress are associate with a higher risk of injury in both men and women, but the magnitude of this relationship is higher in women than in men.

The long-term goal of this study is to better understand risk factors for adverse occupational health outcomes that construction trades workers, especially women, face and how these risk factors can be addressed through prevention strategies. The ultimate goal of this research is to decrease occupational injuries and work-related stress. Based on information in the literature, it appears that

stress may be a mediator between a work-life balance and injury, and this relationship could be further explored in future studies.

METHODS

A. Study Design, Survey Tool, and Study Subjects

In order to investigate the relationships between injury, stress, and work-life balance in construction trade workers, a secondary analysis of cross-sectional survey data from the Safety and Health Empowerment for Women in Trades (SHEWT) study was performed (Curtis, Meischke, Stover, Simcox, & Seixas, 2018).

1. The parent study: Safety and Health Empowerment for Women in Trades (SHEWT)

As described by Curtis et al., the purpose of the SHEWT study was to investigate the difference in occupational exposures, including psychosocial exposures, between women and men and to see how the exposures are associated with stress and injury (Curtis, Meischke, Stover, Simcox, & Seixas, 2018). Curtis et al. focused on how these differences between women and men could negatively affect the health of women in the trades due to concerns raised by community partners regarding women as a minority in the trades and the risk of negative safety outcomes. The multi-phase SHEWT study was performed in collaboration with the University of Washington Department of Environmental and Occupational Health Sciences, Washington Women in Trades, and Washington State Labor and Education Research Center (University of Washington, 2019). The study was promoted by the research team through apprenticeship classes, contractor safety events, union meetings, and social media. Any women and men who were currently working in

construction trades in Washington State were eligible to participate in the study. There were 34 unions, 22 apprenticeship programs, 9 trade associations, and 20 contractors who participated in the study (Curtis, Meischke, Stover, Simcox, & Seixas, 2018). In total, 291 workers completed the study: 198 women (68%) and 93 men (32%). Study procedures were reviewed and approved by the Washington State Institutional Review Board.

2. SHEWT survey

Participants in the SHEWT study completed a survey that was developed using subsets of questions from different existing scales and questions drawn from pilot focus groups (See **Appendix A**). The questions were pilot tested with workers and revisions were made as needed. The original analysis of the survey focused on eight physical and 12 psychosocial exposures. The physical exposures included: dust or fumes, chemicals/acids/solvents, high noise, traffic or moving vehicles, being struck by materials/tools/equipment, working at heights without barriers, electric shocks, and fit of personal protective equipment (PPE). The questions asked participants how often they encountered the various hazards, and choices ranged from “never” to “always”. Psychosocial exposure question topics included: job strain and social support using the NIOSH Generic Job Stress Questionnaire (GJSQ) (Hurrell & McLaney, 1988); gender discrimination, racial discrimination, age discrimination, and work-life balance, using the NIOSH Quality of Work Life Questionnaire (NIOSH, 2010); and bullying, sexual harassment, overcompensation, isolation, tokenism, and safety climate. The NIOSH Quality of Work Life Questionnaire was developed by NIOSH and the National Science Foundation as part of the General Social Survey (GSS). The portion addressing quality of

work life is administered every other year to participants of the GSS, which is a nationally representative personal interview survey of U.S. households. The NIOSH GJSQ is a tool initially described by Hurrell and McLaney in 1988 and has been used frequently since that time. The survey also asked about perceived stress using the Perceived Stress Scale, a well-established scale which measures the degree to which someone perceives a situation as stressful (Cohen, Kamarck, & Mermelstein, A Global Measure of Perceived Stress, 1983). Subjects answer questions regarding their various experiences, selecting from five choices ranging from “never” to “very often”. Questions regarding additional psychosocial exposures were obtained either from other pre-existing surveys, researcher knowledge, or focus groups. Questions pertaining to the injuries were developed by the study team, who had expertise in occupational safety.

3. Exposures and outcomes

The perceived stress variable, used as the outcome variable in Aim 1 and exposure variable in Aim 2 of the present study, was created using the method employed in the SHEWT study. The responses were dichotomized at the 75th percentile to determine low (lower 75%) versus high (upper 25%) stress. The injury (in the past year) outcome variable was created using the same method as that used in the parent study. An injury was defined as an injury requiring first aid or medical attention or requiring time off work.

Work-life balance was used as the exposure variable in Aim 1. The section of the survey addressing work-life balance included questions from the NIOSH Quality of Work Life Questionnaire. The work-life balance variable was created using the responses to the questions “How often do the demands of your *job* interfere with your family or personal

life?” (Often, Sometimes, Rarely, Never, Prefer not to answer) and “How often do the demands of your *family* interfere with your work on the job?” (Often, Sometimes, Rarely, Never, Prefer not to answer). The average answer to these two questions was used. In the original analysis of the data, the question “How hard is it to take time off during your work to take care of personal or family matters?” was used in addition to the other two questions to define the work-life balance variable. In this study, it was felt that this question may be a confounder, rather than a determinant of work-life balance, and was evaluated as such. Those who answered below the 25th percentile (more frequently answered often or sometimes) as an average of the two questions were considered to have poor work-life balance, and the remainder were considered to have good work-life balance.

4. Covariates

Other covariates in this study included gender, trade, career level, age, education level, and household income. In the survey, participants were asked "What is your gender identity?" with the option to answer woman or man. This was asked in such a way as to be inclusive of transgender workers. The options in the survey for trade included boilermaker, carpenter, electrician, ironworker, laborer, mason, operating engineer, painter, pile driver, plasterer, plumber/pipefitter, welder, other, and prefer not to answer. For this study, the trades were categorized into four categories: electrician, laborer, plumber/pipefitter, and other. These categories were developed based on the distribution of the data. Career level was a categorical variable as asked in the survey: apprentice or journey. Apprentices are workers who are in training, and journey-level workers are those who have finished a formal apprenticeship program. Age was categorized as less than 30 years, 30-40 years,

41-50 years, and greater than 50 years. Education level was divided into four categories: less than or finished high school or GED, finished trade/vocational school, some college, and finished college. Household income was dichotomized in the same manner as the parent study: <\$75,000 and >\$75,000. Additionally, the variable work related social support was created using the same method as the original study. Those answering below the 25th percentile as an average of the social support questions were considered to have low social support, and the remainder were considered to have high social support. The question regarding dependents was dichotomized as yes or no. For the question regarding ability to take time off work, those who answered very hard or somewhat hard were considered to have low ability to take time off of work, and those who answered not too hard or not hard at all were considered to have a high ability to take time off work. The question regarding the number of hours doing housework allowed for a free text answer on the survey. These answers were categorized into ≤ 1 hour, > 1 hours to ≤ 2 hours, > 2 hours to ≤ 3 hours, and > 3 hours.

See **Appendix B** for further description of the variables used in this study.

B. Statistical Analysis

1. Descriptive Analysis

The distributions of all variables were examined in a univariate analysis. A bivariate analysis was then performed to see how the variables related to each other (**Appendix C**). Chi square tests were used to compare categorical variables to each other. Before performing the analysis, the assumptions for running this test were assessed. There were several Chi square tests that could not be performed because the expected values of at least

one of the cells was less than five. For these cases, the Fisher Exact Test was used to assess the relationship between variables.

Descriptive statistics (percentages) were computed, and stratified by gender, injury status, and perceived stress level.

2. Inferential Analysis

The relationship between exposures and outcomes were assessed using logistic regression. For both aims, an unadjusted logistic regression model (Model 1) was initially created, and further adjustments were made for a total of five models for each aim. Covariates were selected *a priori* based on the literature. In order to avoid collinearity, variables that were closely related in the bivariate analysis were not included in the same model. Notable examples include the relationships between age and career level, education, and income. Given this, age was selected to be used in the adjusted models and the other highly related variables were omitted. In Aim 1, Model 2 was adjusted for trade and age. In Aim 2, Model 2 was adjusted for trade only. Model 3 for each aim was ultimately considered the main model. In Aim 1, the main model was adjusted for trade, age, and gender. In Aim 2, the main model was adjusted for trade and gender. Model 4 for each aim evaluated for effect modification by gender. In Aim 1, Model 5 was additionally adjusted for trade, age, gender, ability to take time off work, number of hours spent doing housework, presence of dependents, and social support. In Aim 2, Model 5 was additionally adjusted for trade, gender, and age. Two additional models were done for Aim 1 to more specifically investigate the relationship between both “ability to take time off work” and level of social support on the relationship between work-life balance and stress. One model

adjusted for the previous potential confounders (trade, age, and gender) and “ability to take time off work” without adjusting for the other variables used in Model 5. The other model adjusted for social support with the previous confounders (trade, age, and gender), again, without the other variables used in Model 5.

See **Appendix D** for further description of the models used in Aims 1 and 2.

RESULTS

A. Descriptive Analysis

Table 1 shows the distribution of the variables assessed in this study, stratified by gender. A significantly higher percentage of women reported an injury in the last year compared to men (31.3% vs 11.9%, respectively). A higher percentage of women also reported high perceived stress compared to men (31.5% vs 17.8%). Additionally, a higher percentage of women reported having difficulty taking time off work to deal with personal/family issues compared to men (46.2% vs 25.3%).

Table 1. Distribution of variables, stratified by gender, N (%) or mean (sd)

Variable	Woman (n=198)	Man (n=93)	Total (N=291)
<i>Injury in last year (vs no injury)</i>	62 (31.3 %)	11 (11.9 %)	73 (25.1 %)
<i>High (vs low) perceived stress^a</i>	62 (31.5 %)	16 (17.8 %)	78 (27.2 %)
<i>Poor (vs good) work-life balance^b</i>	20 (10.1 %)	6 (6.5%)	26 (9.0 %)
<i>Trade</i>			
•Electrician	40 (20.3%)	15 (16.1%)	55 (19.0%)
•Laborer	41 (20.8%)	23 (24.7%)	64 (22.1%)
•Plumber/pipefitter	15 (7.6%)	14 (15.1%)	29 (10.0%)
•Other	101 (51.3%)	41 (44.1%)	142 (48.9%)
<i>Career level^c</i>			
• Apprentice	73 (36.9 %)	52 (56.5 %)	125 (43.1 %)
• Journey	125 (63.1 %)	40 (43.5 %)	165 (56.9 %)
<i>Low (vs high) social support^d</i>	40 (29.0 %)	11 (16.7 %)	51 (25.0 %)
<i>Age (years)^e</i>			
•<30	27 (14.1%)	20 (23.0%)	47 (16.9%)
•30-40	66 (34.6%)	33 (37.9%)	99 (35.6%)
•41-50	50 (26.2%)	14 (16.1%)	64 (23.0%)
•>50	48 (25.1%)	20 (23.0%)	68 (24.5%)
<i>Dependents^f</i>	95 (49.0 %)	37 (40.7 %)	132 (46.3 %)
<i>Education level^g</i>			
•Less than or finished high school or GED	28 (14.3 %)	18 (20.0 %)	46 (16.1 %)
•Finished trade/vocational school	39 (19.9 %)	13 (14.4 %)	52 (18.2 %)
•Some college	61 (31.1 %)	43 (47.8 %)	104 (36.4 %)
•Finished college	68 (34.7 %)	16 (17.8 %)	84 (29.4 %)
<i>Somewhat/very hard (vs high ability) to take time off work^h</i>	90 (46.2 %)	23 (25.3 %)	113 (39.5 %)
<i>Number of hours spent doing household workⁱ</i>			
• < 1hr	41 (23.0%)	25 (33.3%)	66 (26.1%)
• 1-2 hrs	64 (36.0%)	25 (33.3%)	89 (35.2%)
• 2-3 hrs	40 (22.5%)	11 (14.7%)	51 (20.2%)
• >3 hrs	33 (18.5%)	14 (18.7%)	47(18.6%)
<i>Household income < \$75,000 (vs \$75,000 or greater)^j</i>	111 (59.7 %)	53 (61.2 %)	164 (60.3 %)

^a 4 responses missing, ^b 1 responses missing, ^c 1 response missing, ^d 87 responses missing, ^e 13 responses missing, ^f 6 responses missing, ^g 5 responses missing, ^h 5 responses missing, ⁱ 38 responses missing, ^j 19 responses missing

Table 2 shows the distribution of variables, stratified by level of perceived stress (low perceived stress or high perceived stress). A higher percentage of participants with high perceived stress reported injury compared to those with low perceived stress (37.2% vs 21.1%). A higher

percentage of those with high perceived stress reported poor work-life balance, compared to those with low perceived stress (19.2% vs 5.3%). A higher percentage of those with high perceived stress reported low social support compared to those with low perceived stress (43.6% vs 18.2%). Lastly, those with high perceived stress reported a more difficult time taking off work compared to those with low perceived stress (62.3% vs 31.1%).

Table 2. Distribution of variables, stratified by level of perceived stress, N(%) or mean (sd)

Variable	High Perceived Stress (n=78)	Low Perceived Stress (n=209)	Total (n=287)
<i>Injury in last year (vs no injury)</i>	29 (37.2 %)	44 (21.1 %)	73 (25.4 %)
<i>Poor (vs good) work-life balance^a</i>	15 (19.2 %)	11 (5.3 %)	26 (9.1 %)
<i>Woman (vs man)</i>	62 (79.5 %)	135 (64.6 %)	197 (68.6 %)
<i>Trade</i>			
•Electrician	18 (23.1%)	37 (17.8%)	55 (19.2%)
•Laborer	14 (17.9%)	50 (24.0%)	64 (22.4%)
•Plumber/pipefitter	11 (14.1%)	17 (8.2%)	28 (9.8%)
•Other	35 (44.9%)	104 (50.0%)	139 (48.6%)
<i>Career level^b</i>			
• Apprentice	34 (43.6%)	89 (42.8 %)	123 (43.0 %)
• Journey	44 (56.4%)	119 (57.2 %)	163 (57.0%)
<i>Low (vs high) social support^c</i>	24 (43.6 %)	27 (18.2 %)	51 (25.1 %)
<i>Age (years)^d</i>			
•<30	16 (21.6%)	31 (15.3%)	47 (17.0%)
•30-40	28 (37.8%)	70 (34.5%)	98 (35.4%)
•41-50	17 (23.0%)	47 (23.2%)	64 (23.1%)
•>50	13 (17.6%)	55 (27.1%)	68 (24.5%)
<i>Dependents^e</i>	40 (54.1 %)	91 (43.8 %)	131 (46.5 %)
<i>Education level^f</i>			
•Less than or finished high school or GED	14 (17.9 %)	30 (14.6 %)	44 (15.5%)
•Finished trade/vocational school	13 (16.7 %)	39 (19.0 %)	52 (18.4%)
•Some college	30 (38.5 %)	73 (35.6 %)	103 (36.4%)
•Finished college	21 (26.9 %)	63 (30.7 %)	84 (29.7%)
<i>Somewhat/very hard (vs high ability) to take time off work^g</i>	48 (62.3%)	64 (31.1 %)	112 (39.6%)
<i>Number of hours spent doing household work^h</i>			
• < 1hr	12 (17.9%)	53 (29.0%)	65 (26.0%)
• 1-2 hrs	24 (35.8%)	64 (35.0%)	88 (35.2%)
• 2-3 hrs	17 (25.4%)	33 (18.0%)	50 (20.0%)
• >3 hrs	14 (20.9%)	33 (18.0%)	47 (18.8%)
<i>Household income < \$75,000 vs \$70,000 or greaterⁱ</i>	42 (56.0 %)	120 (61.9 %)	162 (60.2 %)

^a 1 response missing, ^b 1 response missing, ^c 87 responses missing, ^d 13 responses missing, ^e 6 responses missing, ^f 5 responses missing, ^g 5 responses missing, ^h 38 responses missing, ⁱ 19 responses missing

Table 3 shows the distribution of variables, stratified by presence of injury (injury or no injury). A higher percentage of those reporting injury were electricians, compared to those

reporting no injury (26.0% vs 16.6%). A lower percentage of those reporting injury were laborers compared to those reporting no injury (11.0% vs 25.8%).

Table 3. Distribution of variables, stratified by injury status, N(%)

Variable	Injury (n=73)	No Injury (n=218)	Total (n=291)
<i>High (vs low) perceived stress^a</i>	29 (39.7 %)	49 (22.9 %)	78 (27.2 %)
<i>Woman (vs man)</i>	62 (84.9 %)	136 (62.4 %)	198 (68.0 %)
<i>Poor (vs good) work-life balance^b</i>	10 (13.7 %)	16 (7.4 %)	26 (9.0 %)
<i>Trade</i>			
•Electrician	19 (26.0%)	36 (16.6%)	55 (19.0%)
•Laborer	8 (11.0%)	56 (25.8%)	64 (22.1%)
•Plumber/pipefitter	6 (8.2%)	23 (10.6%)	29 (10.0%)
•Other	40 (54.8%)	102 (47.0%)	142 (48.9%)
<i>Career level^c</i>			
• Apprentice	32 (43.8%)	93 (42.9%)	125 (43.1%)
• Journey	41 (56.2%)	124 (57.1%)	165 (56.9%)
<i>Low (vs high) social support^d</i>	11 (23.9 %)	40 (25.3 %)	51 (25.0 %)
<i>Age (years)^e</i>			
•<30	11 (16.2%)	36 (17.1%)	47 (16.9%)
•30-40	26 (38.2%)	73 (34.8%)	99 (35.6%)
•41-50	17 (25.0%)	47 (22.4%)	64 (23.0%)
•>50	14 (20.6%)	54 (25.7%)	68 (24.5%)
<i>Dependents^f</i>	36 (50.7 %)	96 (44.9 %)	132 (46.3 %)
<i>Education level^g</i>			
•Less than or finished high school or GED	9 (12.3 %)13	37 (17.4%)	46 (16.1 %)
•Finished trade/vocational school	(17.8 %)	39 (18.3%)	52 (18.2 %)
•Some college	25 (34.2 %)	79 (37.1%)	104 (36.6 %)
•Finished college	26 (35.6%)	58 (27.2%)	84 (29.4 %)
<i>Somewhat/very hard (vs high ability) to take time off work^h</i>	33 (45.8%)	80 (37.4%)	113 (39.5 %)
<i>Number of hours spent doing household workⁱ</i>			
• < 1hr	15 (23.8%)	51 (26.8%)	66 (26.1%)
• 1-2 hrs	21 (33.3%)	68 (35.8%)	89 (35.2%)
• 2-3 hrs	16 (25.4%)	35 (18.4%)	51 (20.2%)
• >3 hrs	11 (17.5%)	36 (19.9%)	47(18.6%)
<i>Household income < \$75,000 vs \$75,000 or greater^j</i>	42 (60.0 %)	122 (60.4 %)	164 (60.3 %)

^a 4 responses missing, ^b 1 response missing, ^c 1 response missing, ^d 87 responses missing, ^e 13 responses missing, ^f 6 responses missing, ^g 5 responses missing, ^h 5 responses missing, ⁱ 38 responses missing, ^j 19 responses missing

B. Inferential Analysis

1. Aim 1

Aim 1 addressed the hypothesis that poor work-life balance is associated with higher levels of perceived stress. Table 4 shows the results of the logistic regression analyses of the association between work-life balance and perceived stress. In the “main” (moderately adjusted) model, poor versus good work-life balance was associated with 4.38 (95% CI 1.87, 10.61) times the odds of high perceived stress, after adjustment for trade, age, and gender. Additionally, in the main model, being a woman was associated with 2.38 (95% CI 1.23, 4.76) times the odds of high perceived stress when compared to being a man, after adjustment for work-life balance, trade, and age. There was no significant effect modification by gender.

In a further adjusted model, difficulty taking time off work was associated with 2.79 (95% CI 1.17, 6.88) times the odds of having high perceived stress, after adjustment for work-life balance, trade, age, gender, household work time, dependents, and social support. In this same model, having low compared to high social support was associated with 3.70 (95% CI 1.56, 9.09) times the odds of having high perceived stress.

In a model adjusting for trade, age, gender, and ability to take time off work (without the other variables adjusted for in the further adjusted model), poor work-life balance was associated with 3.47 (95% CI 1.39, 9.01) times the odds of high perceived stress. Difficulty taking time off work was associated with 2.96 (95% CI 1.63, 5.46) times the odds of high perceived stress, controlled for trade, age, and gender.

In a model adjusting for trade, age, gender, and level of social support (without the other variables adjusted for in the further adjusted model), poor work-life balance was associated with 2.01 (95% CI 0.70, 5.61) times the odds of high perceived stress. Low social support was associated with 3.13 (95% CI 1.52, 6.67) times the odds of high perceived stress, controlled for trade, age, and gender.

See Appendix E for results of all models.

Table 4: Odds Ratios (95% Confidence Intervals) of High Perceived Stress

	Moderately Adjusted (“Main”) Model	Moderately Adjusted Model with Effect Modification	Further Adjusted Model	Main Model Adjusted for Ability to Take Time off Work	Main Model Adjusted for Social Support
Poor Work-life Balance (ref: good)	4.38 (1.87, 10.61)***	4.78 (1.80, 13.68)**	1.36 (0.40, 4.47)	3.47 (1.39, 9.01)**	2.01 (0.70, 5.61)
Trade (ref: other)					
• Laborer	1.03 (0.48, 2.14)	1.05 (0.48, 2.19)	0.96 (0.33, 2.66)	0.89 (0.40, 1.92)	0.87 (0.35, 2.08)
• Electrician	1.36 (0.65, 2.83)	1.36 (0.64, 2.83)	1.18 (0.38, 3.51)	1.34 (0.61, 2.88)	1.30 (0.50, 3.28)
• Plumber/Pipefitter	2.19 (0.82, 5.67)	2.18 (0.82, 5.66)	0.44 (0.05, 2.45)	2.07 (0.75, 5.58)	1.12 (0.30, 3.78)
Age (ref <30)					
• 30-40	0.79 (0.35, 1.77)	0.80 (0.36, 1.81)	1.07 (0.27, 4.62)	0.80 (0.35, 1.86)	0.64 (0.22, 1.87)
• 41-50	0.69 (0.28, 1.67)	0.71 (0.29, 1.76)	1.58 (0.40, 6.87)	0.77 (0.31, 1.94)	0.90 (0.31, 2.70)
• >50	0.48 (0.19, 1.21)	0.49 (0.19, 1.23)	0.64 (0.15, 2.88)	0.56 (0.21, 1.44)	0.43 (0.14, 1.35)
Woman (ref: man)	2.38 (1.23, 4.76)**	2.27 (1.14, 4.76)*	3.03 (1.15, 10.00)*	2.13 (1.06, 4.35)*	2.56 (1.16, 6.25)*
Poor Work-life Balance x Woman (effect modification)	--	1.45 (0.18, 14.29)	--	--	--
Difficult to take time off work (ref: not difficult)	--	--	2.79 (1.17, 6.88)*	2.96 (1.63, 5.46)***	--
Housework (ref: < 1 hour daily)					
• 1-2 hours daily	--	--	1.92 (0.59, 6.90)	--	--
• 2-3 hours daily	--	--	2.30 (0.66, 8.68)	--	--
• >3 hours daily	--	--	1.60 (0.40, 6.62)	--	--
Low social support (ref: high social support)	--	--	3.70 (1.56, 9.09)**	--	3.13 (1.52, 6.67)**

*p<0.05, **p<0.01, ***p<0.001

2. Aim 2

Aim 2 addressed the hypothesis that high perceived stress is associated with injury.

Table 5 shows the results of the logistic regression analyses of the association between perceived stress and injury. In the “main” (moderately adjusted) model, high versus low perceived stress was associated with 1.96 (95% CI 1.08-3.54) times the odds of injury, after

adjustment for trade and gender. Additionally, in the main model, being a woman was associated with 2.94 (95% CI 1.49-6.25) times the odds of injury when compared to being a man. There was no significant effect modification by gender noted. After adjustment for age in the further adjusted model, the association between perceived stress and injury was similar (OR 1.80) but no longer statistically significant (95% CI 0.97-3.32). In the main model, being a laborer was associated with 0.37 (95% CI 0.15-0.82) times the odds of injury when compared to the other trades categories. This relationship remained statistically significant in the further adjusted model as well.

See Appendix E for results of all models.

Table 5: Odds Ratios (95% Confidence Intervals) of Injury

	Moderately Adjusted ("Main") Model	Moderately Adjusted Model with Effect Modification	Further Adjusted Model
High Perceived Stress (ref: low)	1.96 (1.08, 3.54)*	1.83 (0.95, 3.51)	1.80 (0.97, 3.32)
Trade (ref: other)			
• Laborer	0.37 (0.15, 0.82)*	0.37 (0.15, 0.83)*	0.43 (0.17, 0.97)*
• Electrician	1.26 (0.63, 2.50)	1.26 (0.62, 2.49)	1.36 (0.66, 2.75)
• Plumber/Pipefitter	0.74 (0.25, 1.97)	0.74 (0.25, 1.97)	0.82 (0.26, 2.27)
Woman (ref: man)	2.94 (1.49, 6.25)**	3.33 (1.47, 9.09)**	2.78 (1.37, 5.88)**
Poor Work-life Balance x Woman (effect modification)	--	1.49 (0.30, 6.76)	--
Age (ref <30)			
• 30-40	--	--	1.16 (0.50, 2.79)
• 41-50			0.94 (0.37, 2.44)
• >50			0.83 (0.32, 2.19)

*p<0.05, **p<0.01

DISCUSSION

In this cross-sectional survey study of construction trades workers, poor work-life balance was associated with higher levels of perceived stress after controlling for trade, age, and gender. Additionally, after controlling for work-life balance, trade, and age, women had a higher odds of having high perceived stress when compared to men. High perceived stress was associated with a higher odds of injury compared to low perceived stress. Being a woman was associated with a higher odds of injury when compared to being a man, after adjustment for trade and perceived stress. There was no effect modification by gender for either of the aims evaluated.

The observed relationship between poor work-life balance and perceived stress in our main model is consistent with the existing literature. Curtis et al reported poor work-life balance, difficulty taking time off work, and low levels of social support to be associated with higher levels of perceived stress in both men and women (Curtis, Meischke, Stover, Simcox, & Seixas, 2018). We defined work-life balance differently than the original analysis, using the “ability to take time off work” question as a confounder rather than a determinant of work-life balance. The original analysis adjusted for trade, career level, and age. We adjusted for trade, age, and gender. Despite these differences, the same association was seen, although the magnitude was different. This relationship has also been seen in previous work where work-family conflict has been shown to be related to both burnout and work-related stress (Allen, Herst, Bruck, & Sutton, 2000).

We found no evidence of effect modification by gender. Curtis et al reported poor work-life balance was associated with 7.78 times the odds of high perceived stress in women and 4.70 times the odds of high perceived stress in men, though there was no formal evaluation for effect

modification. The difference in our findings compared to those of Curtis et al may be the result of the different definition used for work-life balance in this analysis compared to the original analysis.

In our further adjusted model for Aim 1, we noted that the association between work-life balance and perceived stress was attenuated and was no longer statistically significant. As this model adjusted for multiple potential confounders, it is possible that there was not adequate power to evaluate for this association. Interestingly, in this further adjusted model, adjustment for “ability to take time off work” resulted in attenuation of the main effect estimate, and the association between difficulty taking time off work and perceived stress was statistically significant in the further adjusted model. The original analysis by Curtis et al used “ability to take time off work” as a determinant of work-life balance and saw a stronger association between work-life balance and perceived stress. To investigate this further, we ran a separate model, with adjustment of the main model for “ability to take time off work” but not “social support”. In this model, poor work-life balance was associated with stress, though the effect was slightly attenuated, and this effect was statistically significant. “Ability to take time off work” was also associated with an increased odds of high perceived stress, independent of the other variables. This finding suggests that there may be some confounding of the main effect by “ability to take time off work” and/or that “ability to take time off work” may be measuring a somewhat different construct than work-life balance (as defined in our study), as it was independently associated with stress.

The findings in this study suggest that low social support is associated with higher odds of high perceived stress is also consistent with previous work. Cohen et al reported that having good social support is beneficial for coping with the effects of stress on one’s level of psychological well-being (Cohen, Social Relationships and Health, 2004) (Vermeulen & Mustard, 2000). In the

further adjusted model, low social support was associated with higher levels of stress, but the relationship between poor work-life balance and stress was attenuated. An additional model was run, adjusting the main model for social support, without the other variables used in the further adjusted model. This analysis also showed an attenuated relationship between poor work-life balance and stress, though this relationship was not statistically significant, and a statistically significant relationship between low levels of social support and high stress. It is plausible that having good social support could confound the relationship between poor work-life balance and stress. These findings point towards the possibility that level of social support is an important factor in relation to stress, and should be further explored.

We found that, after controlling for trade and gender, higher levels of perceived stress were associated with a higher odds of injury. When further adjusted for age in the final model, the effect estimate was similar but was no longer statistically significant, likely due to the decreased power associated with the addition of another variable. Previous studies have identified factors associated with injury in construction trades, but few other studies have focused on the relationship between perceived stress and injury. Curtis et al. reported that gender discrimination, bullying, overcompensation, and sexual harassment were all related to an increased odds of injury in women (Curtis, Meischke, Stover, Simcox, & Seixas, 2018). In men, the only psychosocial factor significantly related to injury was safety climate. A 2007 cross-sectional study did show a three-fold increase in the odds of injury in women who reported their jobs as stressful compared to those who did not, but this relationship did not hold for men (Wilkins & Mackenzie, 2007). While this study did include trades workers in the sample, this finding was not unique for trades workers. A small study among electronic waste recycling workers in Ghana recently showed a correlation between high perceived stress and injury (Burns, Sayler, & Neitzel, 2019). The relationship

between higher levels of perceived stress and injury in construction trades workers deserves further exploration in order to determine whether injury prevention interventions that address perceived stress may be more effective than those that do not address perceived stress.

Our findings of an increased odds of injury in women compared to men, after adjustment for levels of perceived stress and trade, are not entirely consistent with the literature. Previous work comparing injury rates between men and women have shown that overall, men have a higher rate of injury than women in the construction trades (Islam, Velilla, Doyle, & Ducatman, 2001). When further evaluated by injury type, women did have a higher occurrence of some types of injuries, such as sprains, when compared to men. There are several reasons why women may have reported a higher rate of injury than men in our study. These reasons may include lack of appropriate hands on training, lack of adequate PPE that fits properly, gendered division of tasks, and psychosocial exposures. Further research is warranted to better understand the factors influencing injury in women construction workers in order to appropriately target injury prevention efforts.

An additional interesting finding in this analysis was that laborers appeared to be at lower risk of injury when compared to the other trade categories. This relationship was noted to be statistically significant in all four of the adjusted models. While the reason for this may not be readily apparent, there are some potential explanations. Laborers typically do not have the same exposure to some of the physical risk factors that are present in other trade categories, such as electricity and heights. Additionally, in this study, many of the laborers who participated were in apprenticeship training and therefore potentially did not have the same level of exposure to hazards as those who were not in training.

A. Strengths and Limitations

This study has some notable strengths. While women have continued to be exposed to the same occupational risks for decades, little work has been done to better understand these risks and the effects they have on health and safety. The SHEWT survey was specifically designed to look at the difference between workplace exposures for men and women in order to gain understanding into problems that women in the construction trades face. The findings from original analysis of this study were used to create an evidence based pilot mentoring program which aimed to reduce the negative health and safety outcomes that have been seen in women working in the trades.

This study also has several limitations. This is a cross-sectional study, which only allows conclusions to be drawn about correlations between different variables, but does not allow for any determination of causation. Additionally, participants in the study self-selected into the study, and there may be some inherent traits present in those who opted to participate compared to those who did not which could introduce selection bias. Our results may also not be generalizable, as this study population may not be entirely representative of the population of construction trades workers in Washington state or the United States. The data obtained in this survey is all self-reported, which may lend itself to recall bias from the participants. Given the culture of discrimination towards women in the trades, women may have under-reported their actual levels of these exposures and outcomes in order to give the appearance that they can “keep up” with their men peers. This would be expected to bias the results towards the null. All of the participants in this study were currently working, and a “healthy worker bias” or “survivor bias” may have been present, where trades workers with more severe injuries or exposures were no longer working and

therefore their information was never collected. The survey was designed using a combination of questions obtained from existing validated surveys as well as questions developed by the original research group for the purposes of this study. As some of these questions are not previously validated, they may not adequately represent the true exposures and outcomes evaluated. Another limitation of this study is the fact that it is a secondary analysis that is not part of the original study plan. The study therefore may not be adequately powered to answer the questions of interest in this analysis. Finally, another potential limitation to this study is the idea that there may be a difference in the perception of stress between men and women which may have impacted their reporting in the survey. According to the American Psychological Association, men and women report similar levels of stress, but women are more likely to report that their stress levels are increasing (American Psychological Association, 2010). Additionally, women are more likely than men to report having physical symptoms related to their stress. This indicates that there may be a difference in the perception of stress between men and women, which may affect the results of this study, as men and women were evaluated using the same perceived stress scale without any controls for gender.

B. Conclusions and Implications

In conclusion, this study demonstrated an association between poor work-life balance and perceived stress. It also demonstrated an independent effect of being a women on higher risk of stress. Perceived stress was associated with an increased injury risk, and women had a higher risk of injury compared to men, independent of perceived stress level. Further research is needed to formally examine whether perceived stress is a mediator between work-life balance and injury risk. In order to evaluate for mediation, the relationship between work-life balance and injury

would first need to be assessed. If a relationship is noted, an analysis looking at the effect of perceived stress on the relationship between work-life balance and injury would need to be performed. If a decrease or elimination in the relationship between work-life balance and injury is seen with the addition of stress, mediation is likely. As with any analysis of cross-sectional data, this mediation analysis would only be able to show correlation, but not causation. Longitudinal data would need to be collected to confirm these relationships.

Injuries are an ongoing problem within the construction trades with consequences to include lost work time and income, medical costs, and long term health and disability outcomes. This analysis demonstrates an association between injury and stress as well as a relationship between stress and work-life balance, along with other psychosocial exposures. Women continue to be a minority within the construction trades with unique risks and outcomes compared to men. Ongoing research on these topics is needed to better understand these relationships, allow for changes in policies and practices within these trades, and foster safe participation of women in the industry. Our findings suggest a need for injury and stress prevention efforts that address work-life balance and perceived stress within the construction trades.



Department of Environmental and Occupational Health Sciences

Safety and Health Empowerment for Women in Trades (SHEWT) Questionnaire

Thank you for your interest in the SHEWT (Safety and Health Empowerment for Women in Trades) study! This study aims to improve the well-being of women in the construction trades by identifying their key health and safety risks. By completing this survey you are helping us work towards solutions. The survey should take approximately 30 minutes to complete. Before you begin, please answer the following questions to determine your eligibility for this study.

SCREENING QUESTIONS:

1. **Are you currently doing direct construction trades work?**

Yes, currently working

No, temporarily not working

No, permanently left

Do not complete this survey if you are no longer working in the trades

2. **What is your gender identity?**

Woman

Man

INFORMED CONSENT

Safety and Health Empowerment for Women in Trades

Researchers

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Researcher's Statement

Why is the research taking place?

- You are invited to participate in a research study being conducted by the University of Washington because you are someone who works in the trades in Washington State.
- This study is being done to identify and understand the risks that women working in construction trades face on the job.
- The study will include approximately 300 women and 100 men working in construction trades.

- The study is being funded by the Washington State Department of Labor and Industries' Safety and Health Investment Projects Grant Program.

What would I be asked to do?

- The study involves completing a one-time survey, which includes questions about your exposure to chemical and physical hazards, stress, discrimination, and support at work.
- The survey can be completed online, over the phone with an interviewer, or by a mailed hard copy. You only need to complete the survey one time.
- The most personal question asked will be "In the past year, have you experienced losing a job, getting into debt beyond means of repayment, or a period of homelessness?"
- You may refuse to answer any questions without being penalized. All questions will have a "Prefer not to answer" option.

What are the possible risks or harms if I take part?

- Some people may feel that questions about their work are an invasion of their privacy.
- It is possible that questions about certain topics, including sexual harassment at work, may cause some people to feel discomfort while completing the survey.
- The research team is willing to answer any questions you have about the research.
- If you think you have a problem related to this research, contact Hannah Curtis (206-543-2384, hmc Curtis@uw.edu) right away. She will address the relevant issue or refer you for assistance.

What are the possible benefits?

- You will not directly benefit from this research. However, your participation will help increase our understanding of the health and safety risks to women working in construction trades so that researchers can develop programs to reduce risks.

What are my choices if I don't take part?

- Taking part in this research study is completely voluntary. You have the right to refuse to complete the survey at any time.
- If you do not take part in this study you will not lose any benefits, and it will not have any effect on any part of your job.

Who would see study information about me?

- Survey data are confidential. Personal information collected during the screening process will be stored separately from survey data. The Research Coordinator will use your mailing address to send you the gift card.
- Only research staff members employed by the University of Washington will have access to the data.
- Washington Women in Trades members trained by the University of Washington will conduct the phone interview version of the survey. Interviewers will read survey questions aloud and enter your data into the online survey. They will not record any identifying information or have access to the data after they have been entered online. If you choose to take the survey over the phone there is a chance that you may know the interviewer. You may request a different interviewer or complete the online version of the survey without penalty. We will do our best to match you with an unknown interviewer or with the Research Coordinator.
- No identification of individual workers will be made in any summaries, reports, or articles that come out of this study.
- All data will be destroyed no later than June 2022.

Would I be paid for my time? Will the study cost me anything?

- The first 400 eligible participants will receive a \$20 gift card after they have completed the survey. Payment will be given regardless of the information you provide.
- Participating in the study will not cost you anything.
- In order to receive the gift card, you will have to provide us with your mailing address. This contact information will not be linked to any of your survey data.

What else do I need to know?

- You are not required to answer all questions or complete all study procedures.
- If you are willing to be contacted again for future research, you will have the opportunity to check a box at the end of the survey.
- To help us reach as many tradeswomen as possible, you will be asked at the end of the survey to forward the survey link to other people who might be interested in the study. Helping with recruitment is completely voluntary and will not affect your own participation.
- If you have concerns about this study or your participation, you may contact the study staff at the phone numbers listed above.
- You can save and print a copy of this consent form for your records.

If you agree to participate:

The study described above has been explained to me. By checking the box below, I voluntarily consent to take part in this research. I have been told that I can refuse to answer any questions. I have been told that I may call the researchers if I have any questions about the research.

- Yes
 No

*****PLEASE CONSENT TO THE STUDY BEFORE CONTINUING WITH THE SURVEY*****

Please answer the following questions to the best of your ability. Your answers are confidential and will not be shared with your coworkers or supervisor. You can choose not to answer specific questions by selecting "Prefer not to answer." However, we rely on your input to understand the health and safety risks of women and men working in the trades, so please answer all items.

-
- 3. Are you completing this survey by phone interview?** Yes
 No
-

WORK INFORMATION

In this section, we would like to know a little bit about your work history and training.

4. What is your current trade?

- Boilermaker
- Carpenter
- Electrician
- Ironworker
- Laborer
- Mason (Brick, Cement, Tile setter, etc.)
- Operating engineer
- Painter
- Pile Driver
- Plasterer
- Plumber/Pipefitter
- Welder
- Other: _____
- Prefer not to answer

5. How many years have you worked in the trades?

- Less than 1 year
- 1-3
- 4-6
- 7-10
- 11-20
- More than 20 years
- Prefer not to answer

6. How many women, including yourself, are working at your current or most recent jobsite?

- _____ women
- Don't know
- Prefer not to answer

7. Did you go through an apprenticeship training program?

- Yes, completed program
 - Yes, currently in program
 - No →skip to question 13
 - Prefer not to answer
-

APPRENTICESHIP TRAINING

In this section, we would like to know about your apprenticeship or training experience.

8. How many women, including yourself, were in the apprenticeship training class in your first year?	Number of women: _____ <input type="checkbox"/> Don't know <input type="checkbox"/> Prefer not to answer
<hr/>	
9. How many women, including yourself, graduated from the apprenticeship program in your class?	Number of women: _____ <input type="checkbox"/> Don't know <input type="checkbox"/> Currently in the program/haven't graduated yet <input type="checkbox"/> Prefer not to answer
<hr/>	
10. Did/do you have a journey-level worker who acted/acts as your mentor while you were/are an apprentice?	<input type="checkbox"/> Yes, one individual <input type="checkbox"/> Yes, more than one <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
<hr/>	
11. Did/do you experience any hazing (humiliating or dangerous tasks that are part of an initiation) during your apprenticeship?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
<hr/>	
12. Did/do you receive sufficient hands-on training to feel confident in your work?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer

GENERAL HEALTH

This section includes a couple of questions about your general health.

-
- 13. How many days of work have you missed because of personal illness in the past six months?**
- None
 - 1
 - 2-5
 - More than 5
 - Prefer not to answer

-
- 14. How many days in the past six months have you gone to work even though you were feeling sick?**
- None
 - 1
 - 2-5
 - 6-10
 - More than 10
 - Prefer not to answer

-
- 15. In general, how would you rate your health?**
- Excellent
 - Very good
 - Good
 - Fair
 - Poor
 - Prefer not to answer
-

OCCUPATIONAL EXPOSURES

In this section, we would like to know more about your exposure to some traditional occupational health hazards on your current or most recent jobsite.

-
- 16. How often do you work near dust or welding fumes?** 1 (Never)
 2
 3 (About half of the time)
 4
 5 (Always)
 Prefer not to answer

-
- 17. How often do you work with or near chemicals, acids, or solvents that you could breathe in or get on your skin?** 1 (Never)
 2
 3 (About half of the time)
 4
 5 (Always)
 Prefer not to answer

-
- 18. How often are you exposed to high levels of noise?** 1 (Never)
“High noise” means louder than a noisy bar or restaurant, or loud enough that a person has to raise his or her voice to talk to someone 3 feet away or less. 2
 3 (About half of the time)
 4
 5 (Always)
 Prefer not to answer

-
- 19. How often do you work near traffic or moving vehicles?** 1 (Never)
Includes site vehicles such as forklifts or manlifts 2
 3 (About half of the time)
 4
 5 (Always)
 Prefer not to answer
-

20. How often do you work near materials/tools/equipment that could hit or strike you in the head or body?

- 1 (Never)
- 2
- 3 (About half of the time)
- 4
- 5 (Always)
- Prefer not to answer

21. How often do you work at heights (at 4 feet or higher) without barriers to prevent you from falling?

- 1 (Never)
- 2
- 3 (About half of the time)
- 4
- 5 (Always)
- Prefer not to answer

22. How often do you work with/near materials that could electrocute/shock you?

- 1 (Never)
 - 2
 - 3 (About half of the time)
 - 4
 - 5 (Always)
 - Prefer not to answer
-

PERSONAL PROTECTIVE EQUIPMENT

This set of questions asks about your experience using personal protective equipment on the job.

How often do you use the following when exposed to the relevant hazard at your current or most recent jobsite?

	1 (Never)	2	3 (About half of the time)	4	5 (Always)	Not needed on my job	Prefer not to answer
23. Coveralls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. Hard hat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. Eye protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Hearing protection (e.g. ear muff, plugs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. Gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. Fall harness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. Respiratory protection (e.g. filtering face piece or half-mask)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do the following PPE provided at your current jobsite fit you properly?

	Yes	No	Sometimes	Not needed on my job	Prefer not to answer
30. Coveralls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Hearing protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Gloves	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Fall harness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Respiratory protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

35. If PPE does not fit, what do you do?

- Use the closest fit
 - Ask for PPE that fits
 - Don't use any protection
 - Use my own PPE
 - Other: _____
 - Prefer not to answer
-

36. Do you feel comfortable asking for better PPE or PPE that fits you better?

- Yes → ***Skip to question 38***
 - No
 - Prefer not to answer
-

37. Why don't you feel comfortable asking for better fitting PPE?

Select the most important reason

- Nobody else is using PPE
 - Don't want to bother supervisor
 - Fear of layoff
 - Fear of being labeled as complainer by co-workers
 - Other: _____
 - Prefer not to answer
-

WORK ORGANIZATION

The following questions deal with how your work is structured in terms of hours worked, tasks, and changes to your crew.

38. Which of the following best describes your usual work schedule?	<input type="checkbox"/> Day shift <input type="checkbox"/> Afternoon shift <input type="checkbox"/> Night shift <input type="checkbox"/> Split shift <input type="checkbox"/> Irregular shift/on-call <input type="checkbox"/> Rotating shifts <input type="checkbox"/> Prefer not to answer
--	---

39. How many hours per week do you work at your current or most recent jobsite?	_____ hours/week <input type="checkbox"/> Prefer not to answer
--	---

40. How many hours per week do you spend doing secondary work (e.g. cleaning, running errands, etc.) at your current jobsite?	_____ hours/week <input type="checkbox"/> Prefer not to answer
--	---

41. At your current or most recent jobsite, are there opportunities for applying the skills of your trade?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
---	--

42. How many times in the past year have you changed jobsites?	<input type="checkbox"/> Never →Skip to question 44 <input type="checkbox"/> Once <input type="checkbox"/> Twice <input type="checkbox"/> 3 times <input type="checkbox"/> More than 3 times <input type="checkbox"/> Prefer not to answer
---	---

43. When you change jobsites, do you change crews?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes <input type="checkbox"/> Prefer not to answer
---	--

-
44. When changing crews, do you feel you need to prove your ability to do the work? Yes
 No
 Sometimes
 Prefer not to answer
-

45. In the past month, have you been asked to work overtime? Yes
 No
 Prefer not to answer
-

46. How many hours of overtime have you worked in the past month? _____ hours
Please enter 0 if you have not worked overtime
-

We know that working overtime can be welcome or unwelcome.

Please rate how much you AGREE or DISAGREE with the following statements:

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree	Prefer not to answer
47. Thinking only about overtime, the benefits outweigh the drawbacks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48. I welcome the opportunity to work any overtime	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

JOB DEMANDS

The following questions address the demands that your job places on you.

- 49. How often do you have to work very fast on the job?**
- 1 (Never)
 - 2
 - 3 (Sometimes)
 - 4
 - 5 (Always)
 - Prefer not to answer
-

- 50. How often do you have to work very hard on the job?**
- 1 (Never)
 - 2
 - 3 (Sometimes)
 - 4
 - 5 (Always)
 - Prefer not to answer
-

JOB CONTROL

These questions deal with your perceived level of control at your current or most recent jobsite.

51. How much control do you have over the types of tasks you are assigned to do during a work day?

- 1 (Very little control)
 - 2
 - 3 (Some control)
 - 4
 - 5 (A great deal of control)
 - Prefer not to answer
-

52. How much control do you have over how fast or slow you work?

- 1 (Very little control)
 - 2
 - 3 (Some control)
 - 4
 - 5 (A great deal of control)
 - Prefer not to answer
-

53. How much control do you have over when you can take a bathroom break?

- 1 (Very little control)
 - 2
 - 3 (Some control)
 - 4
 - 5 (A great deal of control)
 - Prefer not to answer
-

OVERCOMPENSATION

The following questions deal with how you respond to your physical workload.

54. At your current jobsite, how often do you push yourself past your physical comfort to get the job done?

- 1 (Never)
- 2
- 3 (About half of the time)
- 4
- 5 (Always)
- Prefer not to answer

55. How often do you not have the physical strength to complete the tasks you are assigned?

- 1 (Never)
- 2
- 3 (About half of the time)
- 4
- 5 (Always)
- Prefer not to answer

56. How often do you take special actions to work around problems involving physical strength?

- 1 (Never)
 - 2
 - 3 (About half of the time)
 - 4
 - 5 (Always)
 - Prefer not to answer
-

SAFETY CLIMATE

This section asks about your company’s approach to safety. Please respond about your current or most recent jobsite.

57. Do you work for yourself and do not have management or a direct supervisor?

Yes, I am independent and don’t have any direct supervision on the job →*Skip to question 67*

No, I work for a contractor and am supervised → *Continue this section*

	1 (Strongly Agree)	2 (Agree)	3 (Neither agree nor disagree)	4 (Disagree)	5 (Strongly Disagree)	Prefer not to answer
58. Management encourages employees here to work in accordance with safety rules – even when the work schedule is tight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Management ensures that everyone receives the necessary information on safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Management looks the other way when someone is careless with safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61. Management places safety before production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62. Management accepts employees here taking risks when the work schedule is tight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63. We who work here have confidence in the management’s ability to deal with safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64. Management ensures that safety problems discovered during safety rounds/evaluations are corrected immediately	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65. When a risk is detected, management ignores it without action	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66. Management lacks the ability to deal with safety properly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

UNSANITARY FACILITIES

The next couple of questions ask about restroom availability at your current or most recent jobsite.

-
- 67. Are the number of restrooms provided adequate for the number of people working at the site?** Yes
 No
 Prefer not to answer

-
- 68. Are the restrooms provided sufficiently sanitary?** Yes
 No
 Prefer not to answer

-
- 69. Is running water available at the site for cleaning?** Yes
 No
 Prefer not to answer
-

WORK/LIFE BALANCE

This section deals with the interaction between your work and your responsibilities at home.

70. How hard is it to take time off during your work to take care of personal or family matters?	<input type="checkbox"/> Not at all hard <input type="checkbox"/> Not too hard <input type="checkbox"/> Somewhat hard <input type="checkbox"/> Very hard <input type="checkbox"/> Prefer not to answer
71. How often do the demands of your <i>job</i> interfere with your family life or personal time?	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never <input type="checkbox"/> Prefer not to answer
72. How often do the demands of your <i>family</i> interfere with your work on the job?	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Rarely <input type="checkbox"/> Never <input type="checkbox"/> Prefer not to answer
73. Do you have dependents (children or other relatives) that you take care of on a regular basis?	<input type="checkbox"/> Yes <input type="checkbox"/> No → Skip to question 75 <input type="checkbox"/> Prefer not to answer
74. How many hours per day do you spend taking care of them?	Enter hours _____ <input type="checkbox"/> Prefer not to answer
75. How many hours per day do you spend doing household work (i.e. cooking, cleaning, shopping, laundry, etc.)?	Enter hours _____ <input type="checkbox"/> Prefer not to answer

ISOLATION

The following questions address perceptions of isolation at your current, or most recent jobsite.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Prefer not to answer
76. I often feel alienated from my co-workers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. There is someone at work I can talk to about my day to day work problems if I need to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SOCIAL SUPPORT

These questions concern your relationship with your supervisor and co-workers.

At your current or most recent jobsite, how often does YOUR IMMEDIATE SUPERVISOR:

	1 (Never)	2	3 (Sometimes)	4	5 (Always)	Prefer not to answer
78. Make an extra effort to make your work life easier for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. Make an extra effort to make your work life safer for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80. Be relied upon to help you when a difficult situation arises at work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

At your current or most recent jobsite, how often do your MALE CO-WORKERS:

	1 (Never)	2	3 (Sometimes)	4	5 (Always)	Prefer not to answer
81. Make an extra effort to make your work life easier for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. Make an extra effort to make your work life safer for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. Be relied upon to help you when a difficult situation arises at work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

At your current or most recent jobsite, how often do your FEMALE CO-WORKERS:

	1 (Never)	2	3 (Sometimes)	4	5 (Always)	Not applicable (no female co-workers)	Prefer not to answer
84. Make an extra effort to make your work life easier for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85. Make an extra effort to make your work life safer for you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86. Be relied upon to help you when a difficult situation arises at work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DISCRIMINATION

In this section, we want to know about your experience with unfair treatment at your current or most recent jobsite.

87. Have you been subjected to bullying at the workplace during the last six months?	<input type="checkbox"/> No <input type="checkbox"/> Yes, once or twice <input type="checkbox"/> Yes, now and then <input type="checkbox"/> Yes, about once a week <input type="checkbox"/> Yes, many times a week <input type="checkbox"/> Prefer not to answer
88. At your current or most recent jobsite, do you feel in any way discriminated against because of your age?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
89. At your current or most recent jobsite, do you feel in any way discriminated against because of your race or ethnic origin?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
90. At your current or most recent jobsite, do you feel in any way discriminated against because of your gender?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
91. At your current or most recent jobsite, were you threatened or harassed by anyone?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer

We would now like to ask a few questions about your personal experience with workplace harassment.

Women, Continue this next section

Men, Skip to Harassment Questions for Men (page 23, question 1)

TOKENISM AND HARASSMENT (women only)

The following questions deal with the issue of being underrepresented as a woman in construction. Please answer about your current or most recent jobsite.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Prefer not to answer
92. I feel I have to represent all women at my job	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93. I feel accepted by my male colleagues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For the following items, please check the box that most closely describes your own experience with MALE instructors, supervisors, or coworkers at your current or most recent jobsite over the past month.

	Never	Once or Twice	Sometimes	Often	Many Times	Prefer not to answer
94. ...habitually told suggestive stories or offensive jokes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95. ...made offensive remarks about your appearance, body, or sexual activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
96. ...gave you unwanted sexual attention?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
97. ...displayed, used, or distributed sexist or suggestive materials (e.g., pictures, stories, or pornography)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
98. ...frequently make sexist remarks (e.g., suggesting that women are too emotional to assume leadership roles)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
99. ...made you feel subtly threatened with some sort of retaliation for not being sexually cooperative (e.g., the mention of an upcoming evaluation, review, etc.)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
100. ...touched you (e.g., laid a hand on your bare arm, put an arm around your shoulders) in a way that made you feel uncomfortable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
101. ...made it necessary for you to respond positively in sexual or social invitations in order to be well treated on the job?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
102. ...treated you badly for refusing to have sex with a coworker or supervisor?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HARRASMENT QUESTIONS FOR MEN (men only)

For the following items, please check the box that most closely describes experiences you have WITNESSED with MALE instructors, supervisors, or coworkers **at your current or most recent jobsite over the past month.**

	Never	Once or Twice	Sometimes	Often	Many Times	Prefer not to answer
1. ...habitually told suggestive stories or offensive jokes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ...made offensive remarks about a female co-worker's appearance, body, or sexual activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ...gave a female co-worker unwanted sexual attention?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. ...displayed, used, or distributed sexist or suggestive materials (e.g., pictures, stories, or pornography)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. ...frequently make sexist remarks (e.g., suggesting that women are too emotional to assume leadership roles)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OUTCOMES: INJURY RISK (all genders)

Now we would like to learn about any work-related injuries you experienced in the past year.

103. How many times have you been *injured* at work in the past year? _____ times → *If 0, skip to question 112*
An injury requires first aid or medical attention, or results in time off work Prefer not to answer

104. What type of medical care did you receive for your worst injury at work in the past year? None
 First aid at work
 Treatment from a doctor or other healthcare professional in a clinic or office
 Treatment at emergency room
 Other: _____
 Prefer not to answer

105. How many days of work did you miss due to your worst injury at work in the past year? _____ days
 Prefer not to answer

106. How many days were you assigned to light duty or modified work due to your worst injury in the past year? _____ days
 Prefer not to answer

107. How did your worst injury at work in the past year occur? Contact with objects or equipment
 Fall (includes slips and trips)
 Bodily reaction and exertion (motion that imposes strain on the body, e.g., muscle strain)
 Exposure to harmful substance or environment
 Transportation accident
 Fire or explosion
 Assault or violent act
 Other: _____
 Prefer not to answer

108. What body part was affected by your worst injury at work in the past year?

- Head
- Neck (including throat)
- Trunk
- Upper extremities
- Lower extremities
- Body systems
- Multiple body parts
- Other body parts
- Prefer not to answer

109. Did you report your worst injury at work in the past year?

- Yes
- No → **Skip to question 111**
- Prefer not to answer

110. To whom did you report your worst injury?

(Can select more than one)

→Skip to next section after answering

- Supervisor
- Co-worker
- Health and safety representative at company
- Filed an injury claim with Washington State Department of Labor & Industries
- Prefer not to answer

111. What prevented you from reporting?

- Pain is a natural part of the job
 - Reporting process is too complicated
 - Fear of layoff
 - Fear of being labeled as complainer
 - Other: _____
 - Prefer not to answer
-

OUTCOMES: STRESS

This section asks about your feelings and thoughts during the last month.

	1 (Never)	2	3 (Sometimes)	4	5 (Very Often)	Prefer not To answer
112. In the last month, how often have you been upset because of something that happened unexpectedly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
113. In the last month, how often have you felt that you were unable to control the important things in your life?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
114. In the last month, how often have you felt nervous and "stressed"?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
115. In the last month, how often have you felt confident about your ability to handle your personal problems?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
116. In the last month, how often have you felt that things were going your way?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
117. In the last month, how often have you found that you could not cope with all the things that you had to do?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
118. In the last month, how often have you been able to control irritations in your life?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
119. In the last month, how often have you felt that you were on top of things?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
120. In the last month, how often have you been angered because of things that were outside of your control?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
121. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

122. Stress means a situation in which a person feels tense, restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled all the time.

Do you feel this kind of stress these days?

- Not at all (1)
 - 2
 - Sometimes (3)
 - 4
 - Very much (5)
 - Prefer not to answer
-

123. How often do you find your work stressful?

- Always
 - Often
 - Sometimes
 - Hardly ever
 - Never
 - Prefer not to answer
-

In the past year have you experienced any of the following:

	Yes	No	Prefer not to answer
124. Death of a spouse or immediate family member?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
125. Divorce, marital separation, or marriage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
126. Losing a job, getting into debt beyond means of repayment, or a period of homelessness?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ADDITIONAL COMMENTS

We are very interested in your opinions regarding workplace health and safety for tradeswomen. Please answer the following open-ended questions to help us work towards effective solutions.

127. Are there other experiences you've had at work as a construction worker that you think are relevant for this research?

128. What do you think is the number one problem currently facing women in the construction industry?

129. What changes could the industry make to help solve this problem?

130. Is there anything else you would like us to know about workplace stressors for women?

DEMOGRAPHICS

Finally, we would like to ask for some general demographic information for research purposes.

131. How did you hear about this survey?	<input type="checkbox"/> Through my apprenticeship <input type="checkbox"/> Through my union <input type="checkbox"/> Through my employer <input type="checkbox"/> Through other organizations <input type="checkbox"/> From a friend <input type="checkbox"/> Other: _____ <input type="checkbox"/> Prefer not to answer
---	---

132. In what year were you born?	Year _____ <input type="checkbox"/> Prefer not to answer
---	---

133. Are you of Hispanic or Latino origins?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
--	--

134. How would you describe your race?	<input type="checkbox"/> White <input type="checkbox"/> Black or African American <input type="checkbox"/> Asian American <input type="checkbox"/> American Indian or Alaskan Native <input type="checkbox"/> Hawaiian/Pacific Islander <input type="checkbox"/> Other Pacific Islander <input type="checkbox"/> Multiracial <input type="checkbox"/> Other: _____ <input type="checkbox"/> Prefer not to answer
---	--

135. Are you currently in a union?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Prefer not to answer
---	--

136. What percentage of time throughout your construction career have you spent working under a union contract?	_____ % <input type="checkbox"/> Prefer not to answer
--	--

137. What region of Washington do you live in?

- Olympic
- Northwest
- Southwest
- South Central
- North Central
- Eastern
- Prefer not to answer

138. What is your sexual orientation?

- Straight or heterosexual
- Lesbian, gay, or homosexual
- Bisexual
- Other
- Prefer not to answer

139. What is your marital status?

- Married
- Single
- Divorced
- Widowed
- Domestic partnership
- Prefer not to answer

140. What is your family's yearly income level?

- Less than \$25,000
- \$25,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 or more
- Prefer not to answer

141. What is the highest level of formal schooling you have completed?

- Less than high school
 - Finished high school or GED
 - Finished trade/vocational school
 - Some college
 - Finished college
 - Prefer not to answer
-

* * * * *

Thank you so much for taking the time to complete this survey! Please contact your doctor if any of the questions made you concerned about your health. If you need additional support, please contact your local Regional Support Network: <https://www.dshs.wa.gov/bha/division-behavioral-health-and-recovery/regional-support-networks-rsns-services-information>.

In order to receive the \$20 gift card you will need to provide us with your mailing address. Gift cards will only be sent to participants who completed the entire survey and only to mailing addresses in Washington State. Please put "N/A" below if you do not want to receive a gift card. Your address is confidential and will be stored separately from your survey data. The card will be mailed to the address below within one week of this survey being received by University of Washington.

What is your mailing address?

Are you interested in being re-contacted by the University of Washington for future research?

Yes

No

Thank you again for helping with our study! If you know other tradeswomen who might be interested in taking the survey, please tell them to visit the SHEWT website: <http://deohs.washington.edu/shewt>

Appendix B. Variables Table

Variable	Scientific Meaning	Use in Analysis	Measurement Units	Data Type	Other	Variable Name in Data	# Missing	Coding
Injury	Measurement of outcome	Outcome variable (Aim 2)	<ul style="list-style-type: none"> •Yes (injury in past year requiring first aid, medical attention, or time off of work) •No 	Binary	We will use the same criteria for injury as used in the original study with an injury in the last year that required either first aid or medical attention or required time off of work. This will allow for comparison with the original study.	injured	0	<ul style="list-style-type: none"> •Injury •No injury
Perceived stress	Measurement of outcome (Aim 1) and exposure (Aim 2)	Outcome variable (Aim 1) and exposure variable (Aim 2)	<ul style="list-style-type: none"> •High (< 25th percentile) •Low (≥ 75th percentile) 	Binary	High stress will be considered those <25 th percentile, averaged over all perceived stress scale questions.	stress2cat	4	<ul style="list-style-type: none"> •High •Low
Work-life balance	Measurement of exposure	Exposure variable (Aim 1)	<ul style="list-style-type: none"> •Low (< 25th percentile) •High (≥ 75th percentile) 	Binary	Poor work-life balance will be considered answers <25 th percentile for the questions: How often do the demands of your job interfere with your family life or personal time? And How often do the demands of your family interfere with your work on the job?	wlbalancecat	1	<ul style="list-style-type: none"> •Poor •Not poor
Gender	Demographic	Potential effect modifier (Aims 1 and 2)	<ul style="list-style-type: none"> •Woman •Man 	Binary		a002sex	0	<ul style="list-style-type: none"> •Woman •Man
Trade industry	Demographic	Potential confounder (Aims 1 and 2)	<ul style="list-style-type: none"> •Electrician •Laborer •Plumber/pipefitter •Other 	Categorical	*May consider changing these to dummy variables if we can determine an appropriate way to group them.	tradedcat	0	<ul style="list-style-type: none"> •Electrician •Laborer •Plumber/pipefitter •Other
Career level	Demographic	Potential confounder (Aims 1 and 2)	<ul style="list-style-type: none"> •Apprentice •Journey 	Categorical		apprentice	1	<ul style="list-style-type: none"> •Apprentice •Journey
Social support	Baseline psychosocial information	Potential confounder or precision	<ul style="list-style-type: none"> •Low (< 25th percentile) •High (≥ 75th percentile) 	Binary	Low social support is considered answers averaged <25 th	socialcombc	87	<ul style="list-style-type: none"> •Low •High

		variable (Aim 1)			percentile for the 9 questions pertaining to social support.			
Age	Demographic	Potential confounder (Aims 1 and 2)	<ul style="list-style-type: none"> • <30 • 30-40 • 41-50 • >50 	Categorical		age	13	<ul style="list-style-type: none"> • <30 • 30-40 • 41-50 • >50
Dependents	Demographic	Potential confounder (Aim 1)	<ul style="list-style-type: none"> •Yes •No 	Binary		dependcat	6	<ul style="list-style-type: none"> •Yes •No
Education level	Demographic	Potential confounder (Aims 1 and 2)	<ul style="list-style-type: none"> •Less than or finished high school or GED •Finished trade/vocational school •Some college •Finished college 	Categorical		educat	5	<ul style="list-style-type: none"> •Less than or finished high school or GED •Finished trade/vocational school •Some college •Finished college
Household income	Demographic	Potential confounder (Aims 1 and 2)	<ul style="list-style-type: none"> •<\$75,000 •>\$75,000 	Categorical		income	19	<ul style="list-style-type: none"> •<\$75,000 •>\$75,000
Ability to take time off work for personal or family matters	Baseline psychosocial information	Potential confounder (Aims 1 and 2)	<ul style="list-style-type: none"> •Low (Very hard or Somewhat hard) •High (Not too hard or Not hard at all) 	Binary	Low ability to take time off work is considered answering “very hard” or “somewhat hard” to the question “How hard is it to take time off during your work to take care of personal or family matters?”	offwork	5	<ul style="list-style-type: none"> •Low (Very hard or Somewhat hard) •High (Not too hard or Not hard at all)
# of Hours Spent Doing Housework per day	Baseline psychosocial information	Potential confounder (Aim 1)	<ul style="list-style-type: none"> • ≤ 1 hour • >1 - ≤2 hours • >1 - ≤3 hours • > 3 hours 	Categorical		housewrkhrscat	38	<ul style="list-style-type: none"> • ≤ 1 hour • >1 - ≤2 hours • >1 - ≤3 hours • > 3 hours

Appendix C. Bivariate Analysis

Bivariate Analysis													
	INJURY	STRESS	WLB	GENDER	TRADE	LEVEL	SOCIAL	AGE	DEPEND	EDU	INCOME	OFF WORK	HOUSE WORK
INJURY	X	X ² = 6.96 df= 1 p = 0.008	*X ² = 1.96 df= 1 p= 0.16	X ² = 11.77 df= 1 p = 0.000603	X ² = 9.01 df= 3 p = 0.029	X ² = 8.88 x 10 ⁻⁵ df= 1 p = 0.993	X ² = 0 df= 1 p = 1	X ² = 0.91 df= 3 p = 0.824	X ² = 0.516 df= 1 p = 0.473	X ² = 2.290 df= 3 p = 0.515	X ² = 4.54 x 10 ⁻³¹ df= 1 p = 1	X ² = 1.275 df= 1 p = 0.259	X ² = 1.45 df= 3 p = 0.695
STRESS	See above	X	X ² = 11.8 df= 1 p = 0.0006	X ² = 5.18 df= 1 p = 0.023	X ² = 4.11 df= 3 p = 0.250	*X ² = 0 df= 1 p = 1	X ² = 12.43 df= 1 p = 0.00042	X ² = 3.47 df= 3 p = 0.325	X ² = 1.93 df= 1 p = 0.164	X ² = 0.973 df= 3 p = 0.808	X ² = 0.549 df= 1 p = 0.459	X ² = 21.629 df= 1 p = 3.31 x 10 ⁻⁶	X ² = 3.84 df= 3 p = 0.279
WLB	See above	See above	X	*X ² = 0.60 df= 1 p = 0.44	p = 0.596	X ² = 4.9 x 10 ⁻³² df= 1 p = 1	X ² = 1.85 df= 1 p = 0.174	p=0.299	X ² = 9.47 df= 1 p = 0.002	p= 0.409	X ² = 0.37 df= 1 p = 0.54	X ² = 13.6 df= 1 p = 0.00022	p= 0.594
GENDER	See above	See above	See above	X	X ² = 5.18 df= 3 p = 0.159	X ² = 9.11 df= 1 p = 0.0025	X ² = 2.99 df= 1 p = 0.084	X ² = 5.72 df= 3 p = 0.126	X ² = 1.402 df= 1 p = 0.236	X ² = 12.975 df= 3 p = 0.00469	*X ² = 0.0297 df= 1 p = 0.863	X ² = 10.46 df= 1 p = 0.00122	X ² = 3.84 df= 3 p = 0.279
TRADE	See above	See above	See above	See above	X	X ² = 28.402 df= 3 p = 2.99 x 10 ⁻⁶	X ² = 0.981 df= 3 p = 0.806	p=0.005	X ² = 7.29 df= 3 p = 0.063	p= 0.012	X ² = 3.35 df= 3 p = 0.341	X ² = 2.55 df= 3 p = 0.467	p= 0.233
LEVEL	See above	See above	See above	See above	See above	X	X ² = 0.385 df= 1 p = 0.535	X ² = 89.45 df= 3 p = 2.2 x 10 ⁻¹⁶	X ² = 0.032 df= 1 p = 0.859	X ² = 10.68 df= 3 p = 0.014	X ² = 17.22 df= 1 p = 3.34 x 10 ⁻⁵	X ² = 1.23 df= 1 p = 0.268	X ² = 2.14 df= 3 p = 0.54
SOCIAL	See above	See above	See above	See above	See above	See above	X	X ² = 0.799 df= 3 p = 0.850	X ² = 0.062 df= 1 p = 0.803	X ² = 3.75 df= 3 p = 0.290	X ² = 0.020 df= 1 p = 0.887	X ² = 16.41 df= 1 p = 5.11 x 10 ⁻⁵	X ² = 1.11 df= 3 p = 0.78
AGE	See above	See above	See above	See above	See above	See above	See above	X	X ² = 0.26.25 df= 3 p = 8.45 x 10 ⁻⁶	X ² = 27.35 df= 9 p = 0.001	X ² = 12.18 df= 3 p = 0.007	X ² = 2.36 df= 3 p = 0.501	X ² = 11.96 df= 9 p = 0.215
DEPEND	See above	See above	See above	See above	See above	See above	See above	See above	X	X ² = 1.23 df= 3 p = 0.746	X ² = 8.68 df= 1 p = 0.0032	X ² = 4.63 df= 1 p = 0.031	X ² = 2.02 df= 3 p = 0.57
EDU	See above	See above	See above	See above	See above	See above	See above	See above	See above	X	X ² = 7.90 df= 3 p = 0.0480	X ² = 2.67 df= 3 p = 0.446	X ² = 13.96 df= 9 p = 0.12
INCOME	See above	See above	See above	See above	See above	See above	See above	See above	See above	See above	X	X ² = 1.51 df= 1 p = 0.218	X ² = 0.93 df= 3 p = 0.82
OFF WORK	See above	See above	See above	See above	See above	See above	See above	See above	See above	See above	See above	X	X ² = 3.40 df= 3 p = 0.33
HOUSE WORK	See above	See above	See above	See above	See above	See above	See above	See above	See above	See above	See above	See above	X

 p-value < 0.05 p-value close to being <0.05

Appendix D. Models used in Aims 1 and 2.

-Aim 1: To determine the association between work-life balance and perceived stress. Our working hypothesis is that poor work-life balance is associated with higher levels of perceived stress.

-Sub-aim 1: To determine how this association differs between men and women. Our working hypothesis is that poor work-life balance is associated with higher levels of perceived stress in both men and women, but the magnitude of this relationship differs between men and women.

		Notes	
Model #1	$\text{logit}(p) = \beta_0 + \beta_1 X_A$	Unadjusted Model	$X_A =$ 1: poor work-life balance 0: good work-life balance
Model #2	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C$	Minimally adjusted model—originally had planned to adjust for trade, career level, and age—primarily based on what was done in the original study, but after running the bivariate analysis and seeing that career level and age were very closely related, decided to only adjust for age	$X_B =$ 1: electrician 2: plumber/pipefitter 3: laborer 4: other $X_C =$ age in years $X_D =$ 1: woman 0: man $X_E =$ 1: hard getting off-work 0: easy getting off work $X_F =$ 1: < 1hr 2: 1-2 hrs 3: 2-3 hrs 4: >3 hrs $X_G =$ 1: dependents 0: no dependents $X_H =$ 1: poor social support 0: good social support
Model #3	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C + \beta_4 X_D$	Moderately adjusted “main” model looking additionally at gender as a potential confounder as this is related to both injury and stress in the bivariate analysis	
Model #4	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C + \beta_4 X_D + \beta_5 X_A X_D$	Moderately adjusted model—controlling for identified potential confounders and also looking at gender as a potential effect modifier	
Model #5	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C + \beta_4 X_D + \beta_5 X_E + \beta_6 X_F + \beta_7 X_G + \beta_8 X_H$	Fully adjusted model also looking at ability to take time off work, number of hours spent doing housework, and presence of dependents as possible confounders (or precision variables?)	

-Aim 2: To determine the association between perceived stress and injury. We will test the hypothesis that higher levels of perceived stress are associated with higher risk of injury.

-Sub-aim 2: To determine how this association differs between men and women. Our working hypothesis is that higher levels of perceived stress are associated with a higher risk of injury in both men and women, but the magnitude of this relationship differs between men and women.

		Notes	
Model #1	$\text{logit}(p) = \beta_0 + \beta_1 X_A$	Unadjusted Model	$X_A = 1$: high perceived stress 0 : low perceived stress
Model #2	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B$	Minimally adjusted model—originally had planned to adjust for trade, career level, and age—primarily based on what was done in the original study, but after running the bivariate analysis and seeing that career level and age were very closely related and neither were related to injury, decided to leave these out	$X_B = 1$: electrician 2 : plumber/pipefitter 3 : laborer 4 : other $X_C = 1$: woman 0 : man $X_D =$ age in years
Model #3	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C$	Moderately adjusted “main” model adding gender into the models, gender is related to both injury and stress	
Model #4	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C + \beta_4 X_D + \beta_5 X_A X_C$	Moderately adjusted model controlling for identified potential confounders and also looking at gender as a potential effect modifier	
Model #5	$\text{logit}(p) = \beta_0 + \beta_1 X_A + \beta_2 X_B + \beta_3 X_C + \beta_4 X_D \dots\dots$	Further adjusted model	

Appendix E. Logistic Regression Analysis Results

Table 1: Odds Ratios (95% Confidence Intervals) of High Perceived Stress (Original 5 Models)

	Unadjusted Model	Minimally Adjusted Model	Moderately Adjusted ("Main") Model	Moderately Adjusted Model with Effect Modification	Further Adjusted Model
Poor Work-life Balance (ref: good)	4.20 (1.88, 10.04)***	4.49 (1.95, 10.66)***	4.38 (1.87, 10.61)***	4.78 (1.80, 13.68)**	1.36 (0.40, 4.47)
Trade (ref: other)					
• Laborer	--	0.95 (0.44, 1.97)	1.03 (0.48, 2.14)	1.05 (0.48, 2.19)	0.96 (0.33, 2.66)
• Electrician	--	1.34 (0.64, 2.76)	1.36 (0.65, 2.83)	1.36 (0.64, 2.83)	1.18 (0.38, 3.51)
• Plumber/Pipefitter	--	1.90 (0.73, 4.79)	2.19 (0.82, 5.67)	2.18 (0.82, 5.66)	0.44 (0.05, 2.45)
Age (ref <30)					
• 30-40	--	0.85 (0.39, 1.87)	0.79 (0.35, 1.77)	0.80 (0.36, 1.81)	1.07 (0.27, 4.62)
• 41-50	--	0.80 (0.34, 1.91)	0.69 (0.28, 1.67)	0.71 (0.29, 1.76)	1.58 (0.40, 6.87)
• >50	--	0.54 (0.22, 1.33)	0.48 (0.19, 1.21)	0.49 (0.19, 1.23)	0.64 (0.15, 2.88)
Woman (ref: man)	--	--	2.38 (1.23, 4.76)**	2.27 (1.14, 4.76)*	3.03 (1.15, 10.00)*
Poor Work-life Balance x Woman (effect modification)	--	--	--	1.45 (0.18, 14.29)	--
Difficult to take time off work (ref: not difficult)	--	--	--	--	2.79 (1.17, 6.88)*
Housework (ref: < 1 hour daily)					
• 1-2 hours daily	--	--	--	--	1.92 (0.59, 6.90)
• 2-3 hours daily	--	--	--	--	2.30 (0.66, 8.68)
• >3 hours daily	--	--	--	--	1.60 (0.40, 6.62)
Low social support (ref: high social support)	--	--	--	--	3.70 (1.56, 9.09)**

Table 2: Odds Ratios (95% Confidence Intervals) of High Perceived Stress (Additional 2 Models)

	Adjusted for Ability to Take Time off Work	Adjusted for Social Support
Poor Work-life Balance (ref: good)	3.47 (1.39, 9.01)**	2.01 (0.70, 5.61)
Trade (ref: other)		
• Laborer	0.89 (0.40, 1.92)	0.87 (0.35, 2.08)
• Electrician	1.34 (0.61, 2.88)	1.30 (0.50, 3.28)
• Plumber/Pipefitter	2.07 (0.75, 5.58)	1.12 (0.30, 3.78)
Age (ref <30)		
• 30-40	0.80 (0.35, 1.86)	0.64 (0.22, 1.87)
• 41-50	0.77 (0.31, 1.94)	0.90 (0.31, 2.70)
• >50	0.56 (0.21, 1.44)	0.43 (0.14, 1.35)
Woman (ref: man)	2.13 (1.06, 4.35)*	2.56 (1.16, 6.25)*
Poor Work-life Balance x Woman (effect modification)	--	--
Difficult to take time off work (ref: not difficult)	2.96 (1.63, 5.46)***	--
Housework (ref: < 1 hour daily)		
• 1-2 hours daily	--	--
• 2-3 hours daily	--	--
• >3 hours daily	--	--
Low social support (ref: high social support)	--	3.13 (1.52, 6.67)**

Table 3: Odds Ratios (95% Confidence Intervals) of Injury (Original 5 Models)

	Unadjusted Model	Minimally Adjusted Model	Moderately Adjusted ("Main") Model	Moderately Adjusted Model with Effect Modification	Further Adjusted Model
High Perceived Stress (ref: low)	2.22 (1.25, 3.91)**	2.18 (1.22, 3.91)**	1.96 (1.08, 3.54)*	1.83 (0.95, 3.51)	1.80 (0.97, 3.32)
Trade (ref: other)					
• Laborer	--	0.36 (0.15, 0.79)*	0.37 (0.15, 0.82)*	0.37 (0.15, 0.83)*	0.43 (0.17, 0.97)*
• Electrician	--	1.24 (0.62, 2.42)	1.26 (0.63, 2.50)	1.26 (0.62, 2.49)	1.36 (0.66, 2.75)
• Plumber/Pipefitter	--	0.59 (0.20, 1.52)	0.74 (0.25, 1.97)	0.74 (0.25, 1.97)	0.82 (0.26, 2.27)
Woman (ref: man)	--	--	2.94 (1.49, 6.25)**	3.33 (1.47, 9.09)**	2.78 (1.37, 5.88)**
Poor Work-life Balance x Woman (effect modification)	--	--	--	1.49 (0.30, 6.76)	--
Age (ref <30)					
• 30-40	--	--	--	--	1.16 (0.50, 2.79)
• 41-50	--	--	--	--	0.94 (0.37, 2.44)
• >50	--	--	--	--	0.83 (0.32, 2.19)

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